volumes. A larger printing of Volume I might have reached countless readers in schools and in ancillary fields who might have been led to purchase the entire set. This would have been a distinct contribution to education of the lay public, who in many instances will have no desire or funds to purchase the whole flora, but to whom we have an obligation to make known our concerns.

The introductory essays still are unfortunately too traditional and static or neglect some of the topics pertinent to the present world ecological crisis that could be well illustrated by the Intermountain region. For example, I miss a chapter on calciphily, gypsophily, selenophily and their relation to floristics, coupled with some report on the extent and impact of geobotanical prospecting methods (which have been carried on in some depth here) on the interdisciplinary aspects of systematic botany.

Utah and Nevada have had a history of drastic and continued overgrazing, but there is no discussion of its impact on the flora although the classic area of the Kaibab Plateau is included within the limits of the treatment. Nor is there any discussion of the history of the adventive flora, nor of the original geographic provenance of its weeds. Here, it seems to me, would be a great opportunity to show how the occurrence of weed species depends not only on the accident of introduction, but upon the selective pressure exerted on adventives by the local environment. The American distribution of Eurasian weed species provides a very sensitive indicator of the similarity of our local climates to those of the areas in which these weeds are indigenous in the Old World.

The volume would have benefited greatly from a full-dress discussion of the phenomenon of narrow endemism in arid areas and regions where isolated mountain ranges, deep river gorges, and great saline lakes provide an unexcelled laboratory for the investigation of evolution through edapho-climatic selection. A chapter discussing the actual and potential impact of reclamation dams and their fluctuating shorelines, of the stripmining of coal from the mesas and subsequent pollutants released by the power plants, and the effects of radioactive and other mining wastes upon the environment and its vegetation would also have been highly desirable.

Despite these drawbacks, the Intermountain Flora is the most ambitious attempt of the century to wed the traditional "taxonomists' flora" with much more interesting background of its history and development. Bassett Maguire is to be congratulated for having conceived the great plan and for having inspired so many capable students to carry through the work to completion. The New York Botanical Garden should be proud of the cooperative venture that it has helped to support. Colorado wishes it might have had the opportunity.—William A. Weber, University of Colorado Museum, Boulder 80302.

Keys to the Families and Genera of Queensland Flowering Plants (Magnoliophyta). By H. T. Clifford and Gwen Ludlow. 211 pp., illus. University of Queensland Press, St. Lucia, Queensland. 1972. $9.50. (Available from International Scholarly Book Services Inc., P.O. Box 4347, Portland, OR 97208.)

The title of this small hard-bound volume quite fully describes its sparse contents. The keys to families and to genera seem to be adequate as regards the floral anatomy and general morphology of the taxa included. Because family descriptions based upon Queensland representatives are provided, the family keys offer rather minimal information. Somewhat more morphological information is included in the generic keys in as much as no generic descriptions, nor any other pertinent data, are offered. Thirty-five genera are illustrated by simple line drawings. The aim of

the book is to provide students a means of identifying Queensland plants to the correct family and genus. This stated aim is duly achieved. The volume should in this respect be useful to students and amateur naturalists in Queensland.

The disappointment of the reviewer, as an adopted Queenslander long fascinated with the flora of that much under-advertised Australian state, stems from the vast amount of available pertinent information excluded from the book. So much empty space is wasted in many of the family descriptions and almost all the keys, that one gets the impression that a minimum of information has been squeezed into a maximum of space. True, the authors did not intend the volume to serve as a flora of the state, but Professor Specht, in the foreword, does claim that the volume will serve as an interim handbook to the flora of Queensland. One perhaps could partially agree with him if at least a minimum of information about numbers of species per genera, whether indigenous or introduced, and some ecological and geographical information about each genus had been included. It seems evident that the authors, in their lack of interest in the ecological and geographic distribution of taxa, their indigenous vs. introduced status, and their phylogenetic relationships, are surely not floristic taxonomists, and could not have done much field work throughout Queensland.

In the hope that some of these shortcomings might be rectified in possible later editions of the "Keys", I should like to make respectfully a few suggestions. One suggestion that would require practically no space at all would be to indicate by an asterisk or some other symbol those families and genera that are not indigenous but are either naturalized or cultivated. The capriciousness with which cultivated taxa are included should be rectified to exclude all not naturalized or to include all commonly cultivated. Because perhaps one-third of the indigenous and two-thirds of the naturalized genera are represented by only one species in Queensland, a few words to indicate the habitat and area of the state in which each is found could easily be squeezed with the species name into the line now often represented by three words. For example, on the first page of keys to genera, the following changes might be made. Under the first family Casuarinaceae, the second genus *Gymnostoma* L. A. S. Johnson, that many of us recognize in Queensland, should at least be mentioned. The second and fourth families, Juglandaceae and Salicaceae, should be supplied with a symbol to indicate that they are introduced, not indigenous; or better, omitted altogether because none of their species are naturalized. For the third family Balanopsidaceae (Balanopaceae according to the International Code of Botanical Nomenclature) the line occupied by "Single genus . . . *Balanops*" could much more informatively read: "One species, montane rain forests, NE . . . *Balanops australiana.*" Similarly for family number five, Fagaceae, "Single genus . . . *Nothofagus*", could be replaced by the line, "One species, temperate rain forests, Macpherson Range, SE . . . *Nothofagus moorei.*" For family number six, Ulmaceae, "2 species, coastal forests" could easily be added to the line for *Celtis,* and "3 species, coastal forests" for *Trema.* "One species, rain forests, E. . . . *Aphananthe philippinensis*" probably would require an additional half-line for *Aphananthe.*

The classification used in "Keys" follows Melchior for dicots and Hutchinson for monocots, combining thereby some of the worst features of these two obsolescent classifications. Thus the highly specialized amentiferous, apetalous, and dioecious taxa are listed first, presumably as most primitive. Similarly, the last family treated is the Apostasiaceae, surely among the least specialized of all orchids. One could hope for a much more realistic, and more nearly phylogenetic, classification for a volume intended for students. The treatment of genera is relatively conservative, as is that for most of the dicot families. Some inconsistencies in the treatment of dicot families include the division of the Aizoaceae into Molluginaceae and Aizoaceae; whereas, the widely recognized Gyrostemonaceae is retained in the Phytolaccaceae. The cunoniaceous *Bauera* is retained in the Saxifragaceae and the Chrysobalanoideae in the Rosaceae, yet the three subfamilies of legumes are each raised to family rank. The Erythroxylaceae is not separated from the Linaceae nor *Sphenostemon* from

the Aquifoliaceae; yet, the Hippocrateaceae is segregated from the very closely related Celastraceae, *Leea* from the Vitaceae, *Sonneratia* from the Lythraceae, *Barringtonia* from the Lecythidaceae, Vacciniaceae from the Ericaceae, and *Brunonia* from the Goodeniaceae. The monocot families are very narrowly and unrealistically defined, following the Hutchinsonian tradition. I would treat the 223 families listed by Clifford and Ludlow as 201 valid families, including 175 indigenous, 6 naturalized, and 20 merely cultivated in Queensland.

Larger categories are greatly inflated. The class Angiospermae is, for example, elevated here to divisional status and called the Magnoliophyta. Similarly the monocot and dicot subclasses are elevated to class status as the Magnoliatae and Liliatae. This gross taxonomic inflation seems entirely unwarranted by the morphological facts. The Angiospermae appear to be no more distinct from each class of gymnosperms, like the Cordaitae, Cycadae, Ginkgoae, Coniferae, or Gnetae, than each of these is from one another in the quite adequate division Tracheophyta, the vascular plants.

I have noted few actual errors or serious omissions, either in fact or in typography. A few family names do not follow exactly the list of conserved family names in the International Code. A very few genera, mostly naturalized, have been omitted, and a few native genera appear to be placed in the wrong families. The volume is well-bound and attractively printed. On balance, this small book should find much use in Queensland even though I feel it falls far short of what it could have been with little extra effort or expenditure.—Robert F. Thorne, Rancho Santa Ana Botanic Garden, Claremont, California 91711.

Arctic Adaptations in Plants. By D. B. O. Saville. 81 pp. Monograph no. 6, Research Branch, Canada Department of Agriculture. 1972. No price.

Douglas Saville is a member of the Plant Research Institute of the Canada Department of Agriculture, but he is the living answer to the mythical stereotype of a government scientist with tunnel vision. He has written learned papers on a very wide range of topics from the aerodynamics of the loon's wing to the taxonomy and evolution of the smut and rust fungi (with more than a pause among the flowering plants). Biogeography is one of his strong suits and his studies have carried him all over the Canadian Arctic and beyond. Consequently, he is the ideal author for this survey of arctic adaptations in plants—flowering plants, vascular cryptogams, bryophytes, lichens, algae, and his specially-beloved fungi.

Morphological, physiological, and reproductive aspects of adaptation are treated in relation to winter and summer survival through the vicissitudes of temperature, strong winds and snow abrasion, desiccation, low nitrogen supply, extremes of photoperiod, and the shortness of the growing season that afflict plants occupying arctic habitats. Simplicity of ecosystems and the low density of plant cover create their own special problems for solution. All of these matters are surveyed with an easy writing style and a degree of coverage that, if not exhaustive, is satisfying because it is a distillate from the comprehensive study of the subject by the author. This small book is essential reading for evolutionists and ecologists, even those who will never visit the arctic except vicariously through works such as this. It can be obtained from the Information Division, Canada Department of Agriculture, Ottawa, K1A OC7.—Herbert G. Baker, Department of Botany, University of California, Berkeley 94720.